TEST RESULTS OF GRADATION FOR WMM

Lab ID	:	**CP-RW-2018-12-05-12** **Date: 01-10-18**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at Balance Roads at Doddabommasandra area in Ward No.10(Doddabommasandra),Vidyaranyapura Sub Division.
Agency	:	Sri. N.M.Shivakumar, #7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.
Customer Reference	:	BBMP/EE/BTP/WO/125/2018-19
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	28-09-18
Sample ID No	:	2018-12-05-12/01
Type of Mix	:	WMM (Wet Mix Macadam)
Date of test	:	29-09-18
Oven Dry Weight	:	11000 Grams

IS Sieve Size(mm)	Weight Retained (gm)	Cumulative Weight Retained (gm)	% Cumulative Weight Retained	% Passing	Spec.I.Vide Table 400.13 MORTH Specification
53	0	0	0.0	100.0	100
45	315	315	2.9	97.1	95-100
22.4	2259	2574	23.4	76.6	60-80
11.2	2179	4753	43.2	56.8	40-60
4.75	2251	7004	63.7	36.3	25-40
2.36	1621	8625	78.4	21.6	15-30
0.6	623	9248	84.1	15.9	8-22
0.075	1338	10586	96.2	3.8	0-5

Note:-
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Vidyaranyapura Sub Division
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TEST REPORT OF AGGEGRATE IMPACT VALUE
IS: 2386 Part IV

Lab ID	:	**CP-RW-2018-12-05-12** **Date: 01-10-18**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at Balance Roads at Doddabommasandra area in Ward No.10(Doddabommasandra),Vidyaranyapura Sub Division.
Agency	:	Sri. N.M.Shivakumar, #7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.
Customer Reference	:	BBMP/EE/BTP/WO/125/2018-19
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	28-09-18
Sample ID No	:	2018-12-05-12/01
Type of Mix	:	Coarse Aggregate for WMM (Wet Mix Macadam)
Date of test	:	29-09-18

Sl.No	Particulars of observations	Index	TEST 1	TEST 2
1	Total weight of the surface dry sample sample (passing 12.5 mm and retained on 10mm sieve)	A	300.2	300.2
2	Weight of fraction passing 2.36mm sieve After giving 15 blows	B	73.8	73.9
3	weight of fraction retained 2.36mm sieve After giving 15 blows	C	225.9	225.8
4	Total weight of (B+C) is less than the initial weight (Weight A) by more than one gram the result shall be discarded and a fresh test made.	A-(B+C)	0.5	0.5
5	Aggregate impact value	(B/A)*100	24.6	24.6
6	Aggregate impact value (Mean of two tests)	Pecentage	24.6	

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DETERMINATION OF FLAKINESS INDEX AND ELONGATION INDEX OF COARSE AGGREGATE(IS 2386 (Part 1) 1963 (RA 2007)

Lab ID	:	**CP-RW-2018-12-05-12** **Date: 01-10-18**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at Balance Roads at Doddabommasandra area in Ward No.10(Doddabommasandra),Vidyaranyapura Sub Division.
Agency	:	Sri. N.M.Shivakumar, #7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.
Customer Reference	:	BBMP/EE/BTP/WO/125/2018-19
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	28-09-18
Sample ID No	:	2018-12-05-12/01
Type of Mix	:	Coarse Aggregate for WMM (Wet Mix Macadam)
Date of test	:	29-09-18

Result:

Index	Percentage of Flakiness and Elongation Index	Secified limits as per MORTH specification table 400-12
Flakiness Index	12.9%	Combined Flakiness & Elongation Index for WMM is Maximum 35%
Elongation Index	12.6%	
Combined Flakiness and Elongation Index for WMM	25.5%	

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PHYSICAL REQUIREMENTS FOR COARSE AGGREGATE FOR BITUMINOUS CONCRETE

Lab ID	:	**CP-RW-2018-12-05-12** **Date: 07-10-18**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at Balance Roads at Doddabommasandra area in Ward No.10(Doddabommasandra),Vidyaranyapura Sub Division.
Agency	:	Sri. N.M.Shivakumar, #7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.
Customer Reference	:	BBMP/EE/BTP/WO/125/2018-19
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	04-10-18
Sample ID No	:	2018-12-05-12/01
Type of Mix	:	BC (Bituminous Concrete)
Date of test	:	04-10-18

Table 500-16 : Physical Requirements fo Coarse Aggregate for Bituminous Concrete

Property	Test	Result	Specification	Method of Test
Partical Shape	Flakiness Index	12.5	Combined Flakiness & Elongation Index for BC is Maximum 35%	IS:2386 Part I
	Elongation Index	11.9		
Strength	Aggregate Impact Value	22.5	Maximum 24%	IS:2386 Part IV
Specific gravity	Specific gravity	2.69	Maximum 2.7	IS:2386 Part III
Water Absorption	Water Absorption	0.23	Maximum 2%	IS:2386 Part III

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TEST RESULTS OF GRADATION FOR BC
IS 2386 (Part 1) 1963 (RA 2007)

Lab ID	:	**CP-RW-2018-12-05-12** **Date: 06-10-18**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at Balance Roads at Doddabommasandra area in Ward No.10(Doddabommasandra),Vidyaranyapura Sub Division.
Agency	:	Sri. N.M.Shivakumar, #7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.
Customer Reference	:	BBMP/EE/BTP/WO/125/2018-19
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	04-10-18
Sample ID No	:	2018-12-05-12/01
Type of Mix	:	BC-Plant (Bituminous Concrete)
Date of test	:	04-10-18
Oven Dry Weight	:	5000 Grams

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-17(grading-2)
19	0	0	0.0	100.0	100
13.2	89	89	1.8	98.2	90-100
9.5	702	791	15.8	84.2	70-88
4.75	895	1686	33.7	66.3	53-71
2.36	587	2273	45.5	54.5	42-58
1.18	492	2765	55.3	44.7	34-48
0.6	503	3268	65.4	34.6	26-38
0.3	528	3796	75.9	24.1	18-28
0.15	458	4254	85.1	14.9	12-20
0.075	350	4604	92.1	7.9	4-10
PAN	396	5000	100	0.0	0

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TEST REPORT OF AGGEGRATE STRIPPING VALUE OF ROAD AGGRGATE (IS:6241)

Lab ID	:	**CP-RW-2018-12-05-12** **Date: 07-10-18**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at Balance Roads at Doddabommasandra area in Ward No.10(Doddabommasandra),Vidyaranyapura Sub Division.
Agency	:	Sri. N.M.Shivakumar, #7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.
Customer Reference	:	BBMP/EE/BTP/WO/125/2018-19
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	04-10-18
Sample ID No	:	2018-12-05-12/01
Type of Mix	:	BC(Bitumenous Concrete)
Date of test	:	04-10-18

Type of Binder	:	60/70
% of Binder Used	:	5.0%
Weight of Aggregate	:	200.0 gm
Weight of Binder	:	10.0 gm
Temperature of water bath	:	40°C

No of test	Retained Stripping Percentage	Stripping Percentage	Average Retained Stripping Percentage	Secified limits as per MORTH specification table 500-8
1	98.4	1.6	98.3	Minimum Retained Coating 95%
2	98.5	1.5		
3	98.0	2.0		

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TESTS RESULTS ON STABILITY OF MIX

Lab ID	:	**CP-RW-2018-12-05-12** **Date: 07-10-18**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at Balance Roads at Doddabommasandra area in Ward No.10(Doddabommasandra),Vidyaranyapura Sub Division.
Agency	:	Sri. N.M.Shivakumar, #7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.
Customer Reference	:	BBMP/EE/BTP/WO/125/2018-19
Source of Sample	:	Hot Mix Plant, Bangalore
Sample Condition	:	Satisfactory
Date of Receipt	:	04-10-18
Sample ID No	:	2018-12-05-12/01
Type of Mix	:	BC (Bituminous Concrete)
Date of test	:	04-10-18

The results of the tests conducted on the Bituminous Concrete mix sample are as follow

Sl.No	Particulars of observations	TEST 1	TEST 2	Secified limits as per MORTH specification table 500-11
1	Marshal Stability at 60°C, KN	11.14	11.13	10KN(min)
2	Marshal flow at 60°C, mm	3.52	3.51	2-4
3	Percent air Voids	4.82	4.83	3-5
4	Percent Voids in mineral Aggregate(VMA %)	14.28	14.26	13-15
5	Percent Voids filled with Bitumen(VFB %)	71.87	71.63	65-75
6	Density, g/cc	2.25	2.26	–

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TEST RESULTS OF BITUMEN BINDAR CONTENT AND GRADATION FOR BC
IS 2386 (Part 1) 1963 (RA 2011)

Lab ID : **CP-RW-2018-12-05-12** **Date: 19-10-18**

Customer : Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.

Address : Vidyaranyapura Sub Division, BBMP, Bangalore.

Project Name : Improvements to Roads and Drains at Balance Roads at Doddabommasandra area in Ward No.10(Doddabommasandra),Vidyaranyapura Sub Division.

Agency : Sri. N.M.Shivakumar, #7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.

Customer Reference : BBMP/EE/BTP/WO/125/2018-19

Source of Sample : Sample supplied by Agency

Date of Receipt : 16-10-18

Sample ID No : 2018-12-05-12/01

Type of Mix : BC (Bituminous Concrete)

Date of test : 17-10-18

Sl.no	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	A	500	501
2	Weight of the sample After extraction	B	477	478
3	Bitumen percentage	$\frac{A-B}{A} \times 100$	4.60	4.59
4	Average percentage	%	4.6	

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Lab ID : **CP-RW-2018-12-05-12** **Date: 19-10-18**

Sample ID : **2018-12-05-12/01**

AFTER EXTRACTION - Trail-1

Total Weight of the Sample(gm) : 477

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	4	4	0.8	99.2	90-100
9.5	62	66	13.8	86.2	70-88
4.75	112	178	37.3	62.7	53-71
2.36	88	266	55.8	44.2	42-58
1.18	29	295	61.8	38.2	34-48
0.6	11	306	64.2	35.8	26-38
0.3	46	352	73.8	26.2	18-28
0.15	45	397	83.2	16.8	12-20
0.075	55	452	94.8	5.2	4-10

AFTER EXTRACTION - Trail-2

Total Weight of the Sample(gm) : 478

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-23(grading-2)
19	0	0	0.0	100.0	100
13.2	4	4	0.8	99.2	90-100
9.5	62	66	13.8	86.2	70-88
4.75	112	178	37.2	62.8	53-71
2.36	88	266	55.6	44.4	42-58
1.18	29	295	61.7	38.3	34-48
0.6	11	306	64.0	36.0	26-38
0.3	46	352	73.6	26.4	18-28
0.15	45	397	83.1	16.9	12-20
0.075	55	452	94.6	5.4	4-10

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DETERMINATION OF RATE OF SPREAD TACK COAT

Lab ID : **CP-RW-2018-12-05-12** **Date: 26-09-18**

Customer : Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.

Address : Vidyaranyapura Sub Division, BBMP, Bangalore.

Project Name : Improvements to Roads and Drains at Balance Roads at Ramachandrapura area in Ward No.10(Doddabommasandra),Vidyaranyapura Sub Division.

Agency : Sri. Sri. N.M.Shivakumar, #7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.

Work Order Ref : BBMP/EE/BTP/WO/125/2018-19

Sample Condition : Satisfactory

Date of Receipt : 24-09-18

Sample ID No : 2018-12-05-12/01

Type of Mix : Tack coat

Date of test : 24-09-18

Sl.No	Determination	Unit	TEST 1	TEST 2
1	Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30
2	Area of Plate (a)	Sq.mtr	0.09	0.09
3	Initial Wt of empty Plate (b)	Kg	0.758	0.758
4	Final weight of plate after application of tack Coat (c)	Kg	0.781	0.781
5	Weight of tack Coat (d=c-b)	Kg	0.023	0.023
6	Rate of spread of tack coat	Kg/sq.m	0.256	0.256
7	Average	Kg/sq.m	0.256	
8	Specified Limit	Kg/sq.m	0.250 Kg/sq.m	

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TEST REPORT ON BITUMEN

Lab ID	:	**CP-RW-2018-12-05-12** **Date: 30-09-18**
Customer	:	Assistant Executive Engineer, Vidyaranyapura Sub Division, BBMP, Bangalore.
Address	:	Vidyaranyapura Sub Division, BBMP, Bangalore.
Project Name	:	Improvements to Roads and Drains at Balance Roads at Doddabommasandra area in Ward No.10(Doddabommasandra),Vidyaranyapura Sub Division.
Agency	:	Sri. N.M.Shivakumar, #7, 2nd Block, Juganahalli, Rajajinagara, Bangalore-560010.
Customer's Reference	:	BBMP/EE/BTP/WO/125/2018-19
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	28-09-18
Sample ID No	:	2018-12-05-12/01
Sample Type	:	Bitumen
Reference to BIS codes	:	IS: 1201-1220(1978) (Reaffirmed-2004)
Date of test	:	29-09-18

Test Results

Sl.no	Name of Test	Result	Requirements as per IS:73-2013
1	Penetration at 25°C , in 1/10th mm	**65**	60 to 70
2	Softening Point, °C	**51.5**	Min. 40°C
3	Ductility, cm	**98**	Min. 75cm
4	Flash point, °C	**245**	Min. 220°C
	Fire point, °C	**274**	

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